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EXPERIMENTAL FARM NOTES

No. 2.

CENTRAL EXPERIMENTAL FARM

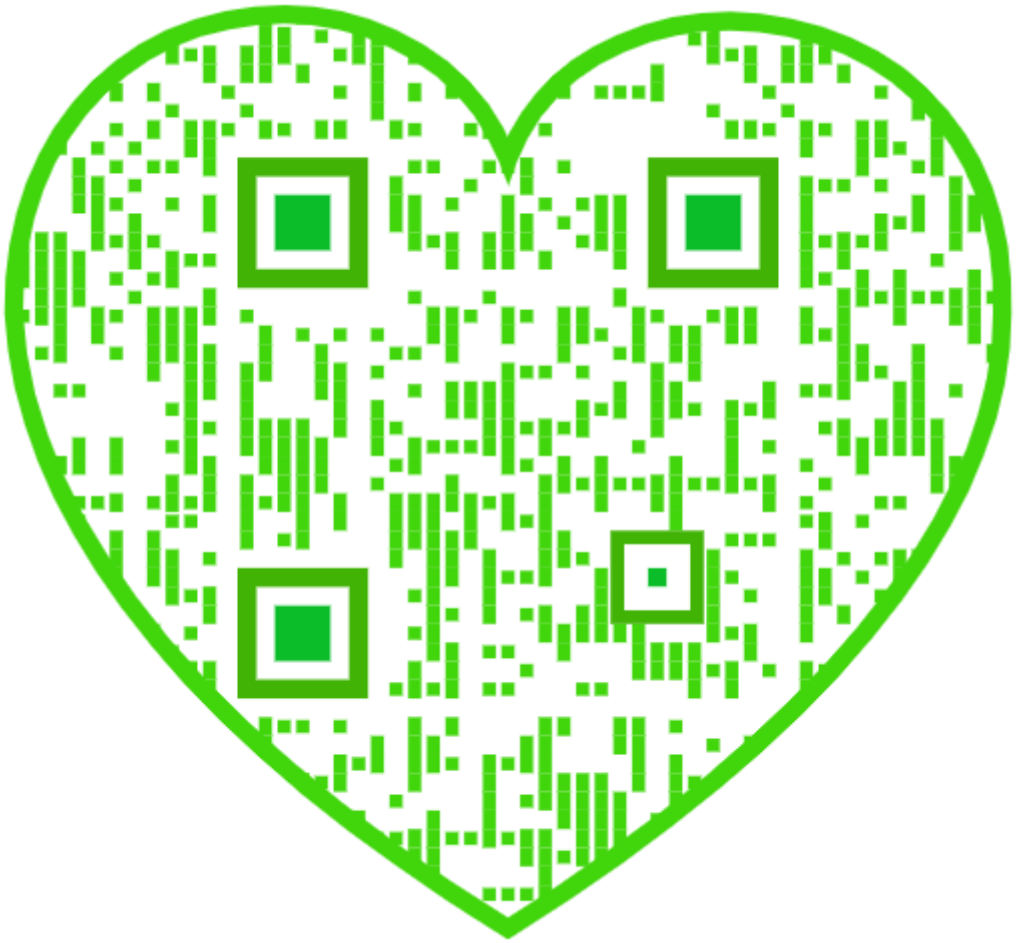
DIVISION OF BOTANY,

DEPARTMENT OF AGRICULTURE.

POTATO BLIGHTS.

PUBLISHED BY DIRECTION OF THE HON. A. R. ANGERS, MINISTER OF AGRICULTURE.

OTTAWA
GOVERNMENT PRINTING BUREAU
1894.



EXPERIMENTAL FARM NOTES

CENTRAL EXPERIMENTAL FARM.

(*Department of Agriculture.*)

DIVISION OF BOTANY.

POTATO BLIGHTS.

By James Fletcher, F.R.S.C., F.L.S.

There are few diseases of field crops which are the direct cause of more loss to the farmers of Canada than the two blights which have been aptly termed by Prof. L. R. Jones, of Vermont, the Early Blight and Late Blight of potatoes. These are usually confounded under the various names "Potato rot," "Potato blight" and "Potato rust;" but, as a matter of fact, although somewhat similar in general appearance they are very distinct and are due to the attacks of two different vegetable parasites.

FIG. 1.—THE EARLY BLIGHT.

(*Kindly lent by Prof. L. R. Jones*)

1. The Early Blight.—This disease is caused by the fungus *Macrosporium solani*, E. & M., and shows itself during the months of June and July, when greyish brown spots appear upon the older leaves. These soon become dry and crisp, and in bad cases the whole leaf is affected, so that nothing is left but the stems and the tubers stop growing.

The appearance of this disease is well shown in fig. 1.

FIG. 2.—THE LATE BLIGHT.
(*Kindly lent by Prof. L. R. Jones*).

2. The Late Blight, Potato Rot.—This disease of the potato is due to the attack of a parasitic fungus, known by the name of *Phytophthora infestans*, D. By. The life history of this enemy is briefly as follows : The fungus passes the winter inside the potato tuber and is planted with it in the spring. As soon as the potato throws out its shoots, the parasite grows with it, running up through the tissues of the stems, and from about the end of July produces beneath the leaves an abundance of spores, or seed-like bodies. These are exceedingly minute, but are produced in such numbers that they frequently give a frost-like appearance to the under sides of the leaves. When these spores are produced on the leaves the appearance known as "rust" shows itself in the shape of dark brown spots, as shown in fig. 2, which are caused by the drying up of the tissues, from the parasite having used up their contents. From the rust stage all future infection takes place. Some of the spores are carried by the wind and falling upon the leaves of other adjacent plants, produce more rust spots, while

others falling to the ground are washed beneath the surface, and reaching the forming tubers produce the rot stage. The wet-rot, as seen in autumn in the tubers, is the form of this disease which is best known, but Potato-rot is really a dry-rot which kills the tubers, and in autumn the wet-rot follows as a result of decay. In winter the disease occurs in the tubers, as patches of hard, whitish, diseased tissue.

In this district the rust stage does not generally appear until about the first of August and this is the first evidence that blight is present in the field. As a rule the dark spots appear only on a few leaves at first, but if the weather be favourable the disease spreads rapidly from spores carried by the wind from these centres of infection, so that a large field may become diseased in a few days, and as a result the crop of potatoes be ruined.

REMEDY.

Careful experiments have shown that by spraying the potato tops five or six times at intervals of about two weeks, beginning early in July, for the early blight, and at the time the rust first appears, for the potato-rot, with the mixture of sulphate of copper and lime, known as the Bordeaux mixture, both of these injurious diseases can in a large measure be controlled.

Bordeaux Mixture.

Copper sulphate	6 pounds.
Lime, fresh	4 "
Water	45 gallons.

To make Bordeaux mixture, take 6 pounds of copper sulphate (blue vitriol) and tie it up in a piece of thin cloth—an ordinary salt bag answers well—then suspend it from a stick laid across the top of a coal oil or other barrel half filled with clean water, so that the bag may be just beneath the surface of the water, when the copper sulphate will dissolve in an hour or two. In another vessel slake 4 pounds of fresh lime in sufficient water to make a thin whitewash. Strain this through a fine sieve or sack to remove all lumps. When the copper sulphate is all dissolved, pour the lime wash into the barrel slowly, stirring the mixture all the time. Now fill up the barrel to the top with water, and the mixture is ready for use.

To apply this mixture to the foliage, undoubtedly the best and cheapest way is to use a proper spraying pump and nozzle, but if these are not on hand, good results which will well repay the trouble, may be obtained by applying the mixture with watering cans supplied with fine roses. There are several different kinds of spraying pumps in the market ; perhaps the most convenient for this work is a force pump attached to a barrel on wheels, to be drawn through the field by a horse. Smaller machines, known as Knapsack Sprayers, consist of a reservoir containing a small force pump, which can be carried upon a man's back. Both of these kinds of pumps can be purchased for about $10 to $20, and are now for sale by most of our seedsmen. It will be necessary to spray the field two or three times to protect the crop thoroughly. There is no danger of injuring the foliage with the above mixture.

A great advantage of this mixture is that Paris Green, the only practical remedy for the Colorado Potato-beetle, can be applied at the same time. To do this, mix from a quarter to half a pound of Paris Green with a little water so as to make a thick paste, and then add it to the 45 gallons of Bordeaux mixture ; that is, it is used in exactly the same strength as with plain water.

These mixtures must be kept constantly stirred while being used, as both the lime in the Bordeaux mixture and the Paris Green sink quickly to the bottom of any mixture if left undisturbed.

The time to apply.—The Bordeaux mixture is a preventive remedy, and the time to apply it in any locality is just before the blights treated of usually appear there, the object being to keep the plants, during the whole of the time they are liable to injury, covered with the fungicidal preparation.

The early blight in this part of Canada generally appears at the end of June or early in July. The late blight or potato-rot seldom shows itself until August. Therefore, spraying should be begun early in July and repeated every two weeks at least until the end of August.

WM. SAUNDERS,
Director.

J. FLETCHER,
Botanist.

OTTAWA, July 1, 1894.